

type is good and the illustrations form an important feature, being artistic and at the same time expressive and useful.

Physiology for Beginners. By Leonard Hill, M.B., F.R.S. Pp. viii + 124. (London: Edward Arnold, 1902.) Price 1s.

In this tiny volume the author has set himself the difficult task, as he describes it in his preface, of putting in simple language the essential facts concerning the structure and functions of the human body.

The book is intended for junior students who have no previous knowledge of the subject, and it may be said that the author has put forward the main essentials of the subject in an attractive way such as ought to engage the interest of school children, for whom the book is obviously intended. The author clothes his subject in the homeliest possible phraseology, avoiding technical terms and hard names so far as can be done in dealing with such an abstruse subject, and instead of giving dull definitions he suggests and then answers questions which must arouse interest in the juvenile mind.

Although mainly written for use as an elementary school book, the volume may be recommended to anyone who wishes to obtain some knowledge of the functions of the different organs of the body without the trouble of a detailed or technical study of the subject.

The book is artistically got up and adorned with many clear and well-drawn illustrations of the subject-matter.

B. MOORE.

Die Philosophie August Comte's. By L. Lévy-Bruhl. German translation by H. Molenaar. Pp. 286. (Leipzig: Dürr'schen Buchhandlung, 1902.) Price Mk. 6.

THIS is a careful translation into German of a full and sympathetic study of Comte's positivist philosophy in all its aspects. M. Lévy-Bruhl is not one of those more cautious disciples who, like Littré, rejected Comte's religion in the name of his philosophy. He boldly defends the whole later development with its curious substitute for Catholicism as a necessary consequence of the original Comtian conception of a reform of society operating by means of a reform of philosophy. The actual subject of his book is, however, the philosophy apart from the subsequent developments. He treats with lucidity and knowledge in his first book of the foundations of the positivist doctrine, the alleged "law of the three stages," the classification of the sciences and the concept of law. In books ii. and iii. he presents a sketch of the natural and social sciences, exhibiting their interrelation. The concluding book is devoted to an exposition of the positivist ethics. The translation reads well and pleasantly, and makes one wish that we in England, where Comte is more talked about than studied, possessed a statement of his doctrine at once so lucid and so concise.

A. E. T.

Elementary Coal Mining. By George L. Kerr. Pp. 225. (London: Charles Griffin and Co., Ltd. 1902.) Price 3s. 6d.

THIS volume "is meant as an introductory manual to the larger and more advanced text-books." The subject-matter is dealt with in fourteen chapters, at the end of each of which there are examination questions. The information is given concisely and in a form adapted for easy assimilation by students preparing for the examinations held under the Education Department and the County Councils and under the Home Office for under-managers' certificates. There is no striking novelty in arrangement or in the matter dealt with. The 200 illustrations are good and clear. Several of them appear to have been borrowed from Mr. Herbert W. Hughes's well-known text-book, with no mention of the source.

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LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Earthquake of May 28 at the Cape, and Coincident Meteorological Effects.

As certain peculiar meteorological phenomena seem to have been closely associated with the earthquake felt in the Cape Peninsula on May 28, the following particulars of this occurrence seem to deserve notice.

After being practically calm all day, a loud sound resembling a clap of thunder or the rumbling of approaching heavy waggons was heard about 11.45 p.m. (Cape mean time of $22\frac{1}{2}^{\circ}$ east), followed in Cape Town and Green Point by a heavy downpour of rain, and in the suburbs by a severe squall of wind and rain; practically simultaneous with the sound there occurred a shaking and rattling of windows and doors; some state they felt also a distinct shock, others that their beds rocked, while information was received of the cracking of the walls of at least two dwelling houses. The wind-squall was strong enough to uproot or blow down trees in some of the eastern suburbs. One gentleman, whose written account is in our possession, states that "it fairly shook the room and its contents which I occupy at Rosebank; shortly afterwards a similar sound (tremor?) was felt; it lasted only a few seconds and died away." Dogs were apparently conscious of the occurrence, one which was never known to be affected by thunder or lightning moving about and whining in a peculiar manner, while a parrot indicated by its screeching that it was sensible of something unusual happening.

Our meteorological records show that rain fell (except on May 19) every day from May 17 to May 24, amounting to 3.10 inches at the Royal Observatory and to 7.45 inches at Newlands. Between the 24th and 28th, although no rain fell, there was almost an entire absence of drying winds, being chiefly light from the N.W., from which direction comes the bulk of the Cape Peninsula rainfall.

Barometric pressure was high, 30.071 inches at 8 a.m. on May 27, but fell steadily to 29.775 inches at 6 p.m. on May 28, after which it remained stationary, so far as hourly eye-readings showed, until 11 p.m.; between 11 p.m. and midnight it fell to 29.717 inches, and rose rapidly to 29.771 inches at 12.15 a.m. on May 29, to 29.809 inches at 12.25 a.m., and to 29.817 at 12.30 a.m., unusually large and rapid fluctuations for the Cape Peninsula, and suggesting at once the presence of thunderstorms in the neighbourhood. These rapid variations in pressure might account for the rumbling sound, on the supposition of it being thunder, also for the wind-squall, and even for the rattling of doors and windows (not affected by ordinary winds), but fails to account for the "rocking" of the beds, the cracking of walls and the unusual behaviour of the dog already mentioned, all these inducing the belief that an actual "earthquake" was experienced.

No record of any seismic disturbance was, however, shown on the seismometer at the Royal Observatory.

The lightkeeper at Cape Point makes these remarks on his meteorological schedule for May:—"28th: wind S.E. to S.W., light; silent lightning from N. to N.W. at 8 p.m., then thick fog from 10.30 p.m., and a light drizzling shower at 11.45 p.m. Fog and rain till midnight, then thunder and lightning at midnight; again rain off and on from 1.40 a.m. till 8 a.m. on May 29."

Through the courtesy of Mr. D. E. Hutchins, Conservator of Forests, the writer has been enabled to examine his barogram obtained at Cape Town for the period between Tuesday, May 27, and Sunday, June 1. This record shows a dip in the curve occurring after 11 p.m. on May 28. Similar irregularities are recorded for the early mornings of May 29 and 31; these too were associated with thunderstorms, but may be connected with the West Indian eruptions of about the same date, an account of which is given in your issue of June 5.

In the absence of fuller information than is in our possession at present, no definite connection can be traced, but these phenomena seem to be closely related one to the other. At least, it will be admitted that a comparison of this barographic curve with the diary of events in the West Indies shows some

¹ Corrected to 32° Fahr., but not to sea-level; approximate height of barometer, 40 feet.

most peculiar coincidences :—(1) Renewal of eruption of Mont Pelée on morning of May 28 ; peculiar atmospheric disturbance at the Cape, simultaneous with earthquake shock there. (2) Renewal of irregularities in pressure curve on May 29 and 31 and early morning of June 1, there being renewed volcanic disturbances in West Indies on or about these same dates. The curve for these last two days is remarkable, resembling closely a series of ripples and suggesting “interference” effects.

Which was cause and which effect, or is there any correlation whatever ?

CHARLES STEWART.

Meteorological Commission, Cape Town, July 16.

A Tripartite Stroke of Lightning.

AT about 6.50 p.m. on August 7, after two or three preliminary low thunder rumblings, which by no means prepared us for what was to come, a most tremendous crash of combined thunder, lightning and electric discharge burst right over my residence here.

My butler, who was looking in the direction of our front gate, 80 yards to the north of our front door, saw a burst of smoke, mingled with a shower of leaves, rise into the air out of the adjoining shrubbery.

My coachman, who was sitting just within the open door of the lodge, close to the front gate, was dazed by a vivid burst of flame at his feet which seemed to leap into the doorway.

My neighbour's gardener, looking out of the lodge opposite, saw a nearly horizontal flash of fire enter the shrubbery close to my front gate.

A subsequent examination of the surroundings of the front gate and my coachman's lodge has revealed :—

(1) A tearing up of the ground close to the massive iron post of the front gate, the splitting of a large flint at its foot, and a litter of ivy leaves on the gravel.

(2) The clean cutting in two of an oak post, 35 yards distant to the north-east, from which an iron hand-gate was hanging.

(3) The scorching of the outside foliage of a horse-chestnut some 15 yards still further off, in a direct line with the other two objects struck.

In thirty years' experience of thunderstorms, which are rather frequent here, I have never observed the simultaneous striking of three different points by the electric discharge. A death-like stillness succeeded the crash, the storm appearing to have exhausted itself in a single tremendous explosion. Heavy rain was falling when the crash occurred. I have measured an inch and a half of rain-fall within the last three days.

Six Mile Bottom, Cambs., August 8. W. H. HALL.

Colours between Clouds at Sunset.

ABOUT sunset on the evening of Sunday, July 13, being at Ripon with my son, our attention was arrested by an unusual appearance, which I will briefly describe. Two large clouds, covering a considerable portion of the western sky, and separated by an interval leading generally towards the west, were each bordered along this interval by a bright and well-marked double spectrum. The two spectra forming this were together of the width of about one and a half times the diameter of the sun ; they followed the foldings of the edge of the clouds, and, which suggests a partial explanation, were at right angles to a fringe of nebulous striæ, which bordered the clouds, so that, except that the spectral colours were parallel instead of consecutive, the phenomenon had in some degree the appearance of the reflection from a grating.

Our observation lasted about twenty minutes, and it was especially noticeable that when, through the fading light, the more refrangible colours had disappeared, the two red lines on the rim of each cloud remained clearly marked to the last.

Never having previously seen or even heard of such an appearance, any information on the subject would be much appreciated. I might also report that on the evening of July 17 the pink streamers mentioned by some of your correspondents could be well observed, and had they been less stable, and had they radiated from the north instead of from the position of the setting sun, the appearance would have much resembled the Aurora Borealis.

JOHN BADDELEY.

Adswold, Bury New Road, Higher Broughton, Manchester.

Retention of Leaves by Deciduous Trees.

ONE of the proofs in favour of this being caused by early frost is that frequently on exposed beech and other deciduous trees only the leaves near the ground are affected and remain brown on the trees until the spring. Leaves higher up escape the frost and fall normally, as these early frosts are usually confined to the strata of air near the ground.

W. R. FISHER.

Coopers Hill, Englefield Green, Surrey, August 8.

THE WEST INDIAN ERUPTIONS.

AMONGST the last contributions to our knowledge of the eruptions which so recently devastated portions of the West Indies are five preliminary reports to the National Geographic Society. These, with excellent illustrations, appear in the July magazine of the Society.

In the following notes upon these reports attention is drawn to those portions of their contents which are not generally known, and to these are added a few observations made by witnesses, particularly those made by Captain E. W. Freeman, of the s.s. *Roddam*, whose experiences, although he was interviewed by members of the American expedition, have as yet received but slight consideration.

The first report is by Mr. Robert T. Hill, of the U.S. Geological Survey, who, with other scientific investigators, accompanied a relief expedition in the U.S. steamer *Dixie*, which sailed from Brooklyn Dock on May 14.

Notwithstanding the ill-advised introduction of matters foreign to the object of a scientific expedition, the bulk of Mr. Hill's report is well worth consideration. La Montagne Pelée, which has been introduced to our notice as the goddess of Hawaii and as the mountain which is bare or “naked,” is now referred to as the “shovelfull,” an allusion possibly to its form. In May, 1901, we are told that a picnic party discovered on its summit a small fume rising at one corner of its crater lake. On April 23 three distinct shocks were felt in St. Pierre, and everybody saw a great cloud of smoke rising from the summit crater. Two days later the lower Soufrière was in eruption, and from this date until May 5 the showers of ashes steadily increased. The succeeding sequence of events has already been published in these columns, whilst the observations of April 23 bring us nearer to the seismic disturbances of April 19, which, although they originated in Central America, there are strong reasons to suspect were the primary cause of disturbances in the Antillean fold.

As the introduction to the account of the catastrophe Mr. Hill mentions his witnesses, and here we find for the first and last time in these reports the name of Captain Freeman. Certainly there is a reference to his vessel. According to engineer Evans, of the *Roraima*, which was burned, the *Roddam* was lifted on a wave “so that her anchor chain broke and she was enabled to escape,” which is not correct. Now at the time the great and fatal blast swept across St. Pierre and its roadstead, Captain Freeman was on the deck of his vessel—then about three ships' lengths from the shore—and for some time at least could see what occurred, whilst other witnesses whose testimony is referred to had sought refuge in engine-rooms or down below. Captain Freeman says that although there were many minor puffs of clouds from Pelée there was only *one* great eruption, and this came from the side of the mountain. There were no detonations or loud reports, and from his point of view there was no sheet of flame accompanying or following the blast. The force of this, which came with the wind, was so great that he believes it was the cause of the s.s. *Grappler* turning turtle. There was no return blast, neither was there any absence of air. The difficulty in breathing was due to the quantity of fine ash with which the atmosphere was charged and the fetid gases with which it was mixed.